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ENVIRONMENTAL RESTORATION PROGRAM
GUIDANCE FOR CMS/FS IMPLEMENTATION AT THE
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

U.S. Department of Energy
Rocky Flats Environmental Technology Site
Golden, Colorado

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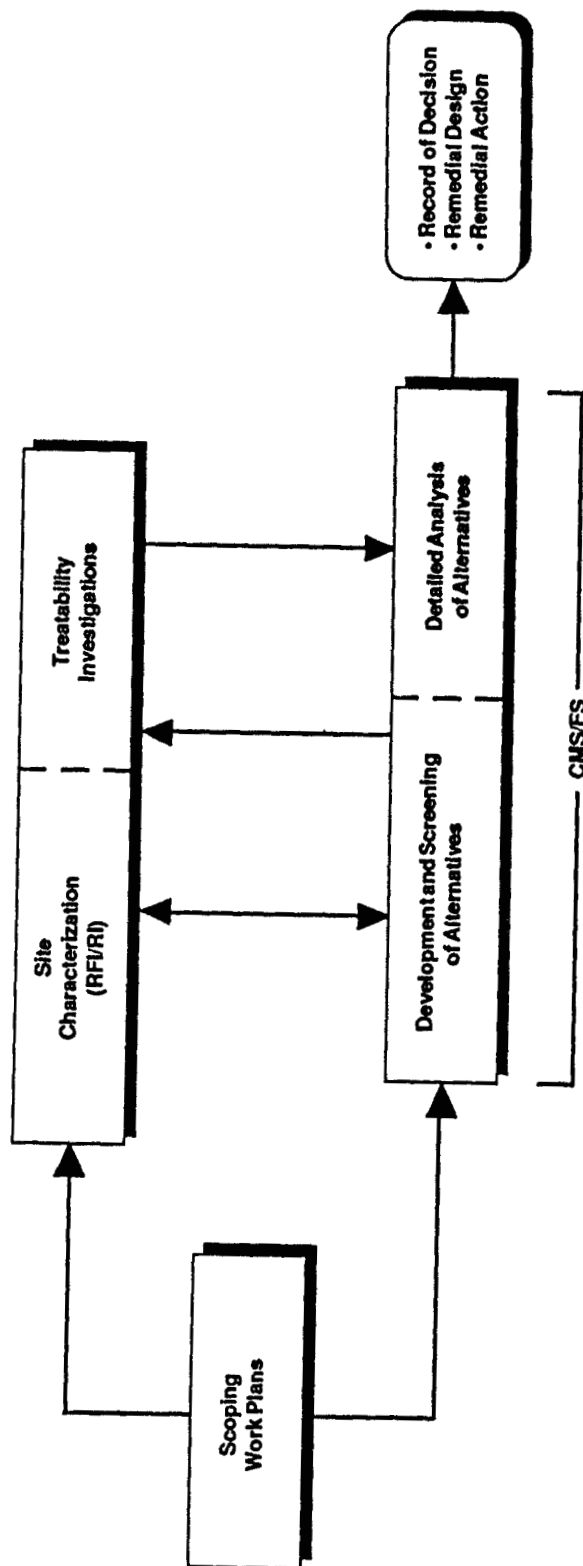
1.0 INTRODUCTION

This Corrective Measures Study/Feasibility Study (CMS/FS) Guidance Document establishes a standardized process for conducting the CMS/FS portion of the remedial activities being performed at the Rocky Flats Environmental Technology Site (RFETS). The intent of this document is to provide Operable Unit (OU) Project and Task Managers guidance for preparing CMS/FS documents that are required to be submitted to regulatory agencies in accordance with the scope of work set forth in the Interagency Agreement (IAG). The goal of this document is to ensure consistency of documents between the various OUs and to streamline the CMS/FS process.

The CMS/FS is conducted in conjunction with the RCRA Facility Investigation/Remedial Investigation (RFI/RI) to develop and evaluate potential remedial alternatives that could be used to mitigate releases of contaminants from Individual Hazardous Substance Sites (IHSSs) located within an OU. Figure 1 shows the relationship between the CMS/FS, RFI/RI, and subsequent remedial design activities. The overall goal of the CMS/FS process is to select a remedial alternative that

- Protects human health and the environment,
- Complies with all identified Applicable or Relevant and Appropriate Requirements (ARARs),
- Provides a cost-effective solution, and
- Yields safe working conditions during implementation to both onsite remediation workers and offsite public.

Both treatment and containment technologies are to be considered during the development and evaluation of remedial alternatives. CERCLA regulations indicate a preference for remedial alternatives that employ treatment as a principal element to permanently and significantly reduce



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Figure 1
Overall RFI/RI and CMS/FS
Flow Chart

Reference EPA, 1988

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the volume, toxicity, or mobility of the contaminants. Permanent solutions and innovative treatment and/or resource recovery technologies are required to be considered and used to the maximum extent practicable. CERCLA also discourages the selection of remedial alternatives that involve the offsite disposal of untreated waste materials in situations where practicable treatment technologies are available. Should the selected remedial alternative require hazardous substances, pollutants, or contaminants to remain onsite upon completion of remedial activities, the remedial action needs to be reviewed every five years to ensure that the action is protective. The five year reviews are to continue for as long as the remaining hazardous substances, pollutants, or contaminants pose a threat to human health or the environment.

An additional component of the CMS/FS process is consideration of natural environmental resource damage that the remedial action may not mitigate, or that the remedial action may create. It is the intent of DOE that the remedial alternatives evaluated under the Rocky Flats Cleanup Agreement (RFCA) include identifying and quantifying natural resource injury and an estimation of natural resource damages. In this way, complete life cycle costs, as identified in the National Contingency Plan (NCP), can be evaluated. This guidance document addresses this issue under the detailed analysis of alternatives.

2.0 CMS/FS TASKS

This document establishes the approach and work processes to be performed to achieve the above-mentioned goals when determining the appropriateness of potential remedial alternatives. The primary steps of the CMS/FS process include:

- Establish Corrective/Remedial Action Objectives (C/RAOs),
- Develop General Response Actions (GRAs) and identify potential remedial technologies and process options,
- Screen potential remedial technologies and process options and develop a list of representative process options (RPOs),

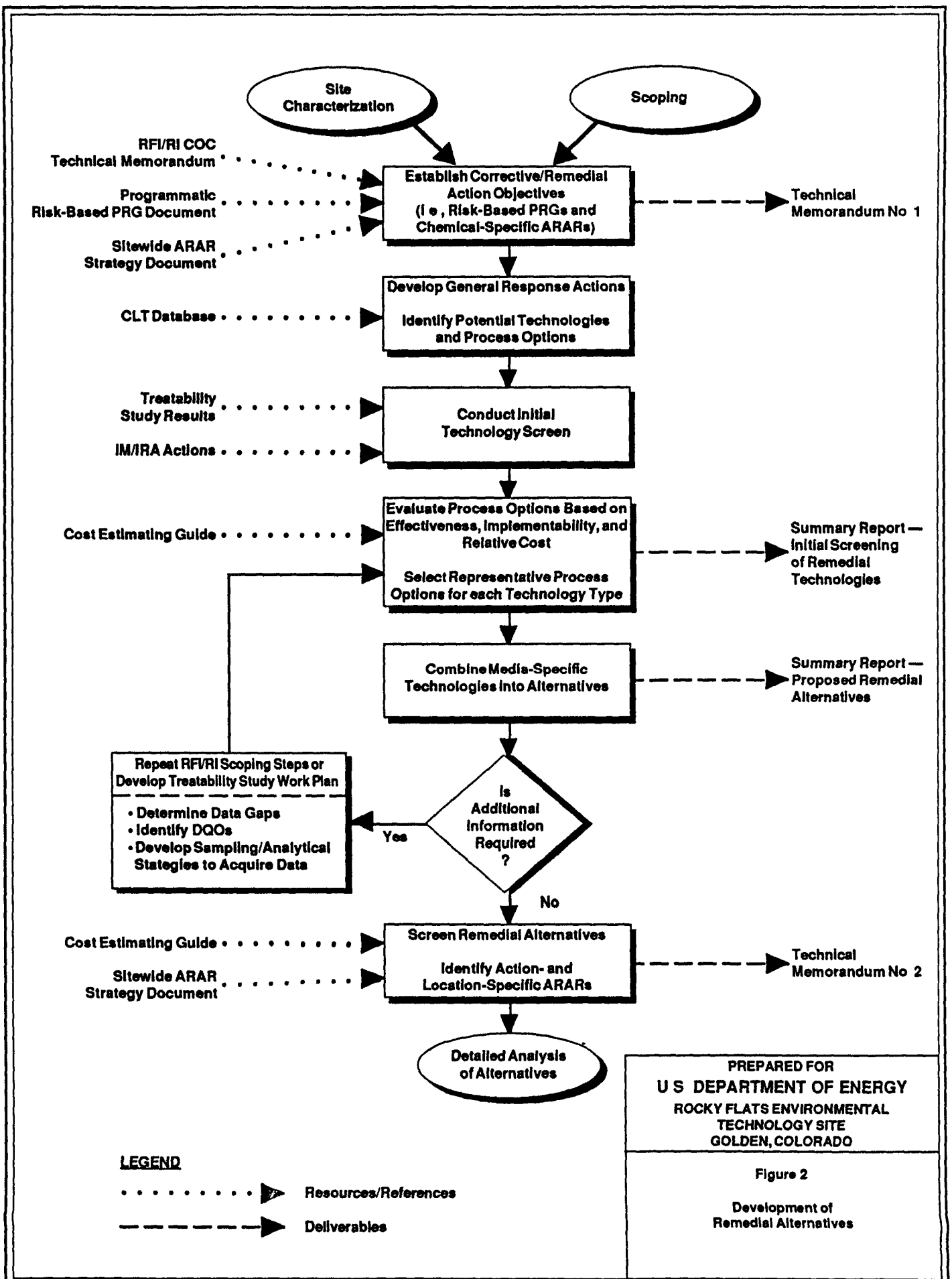
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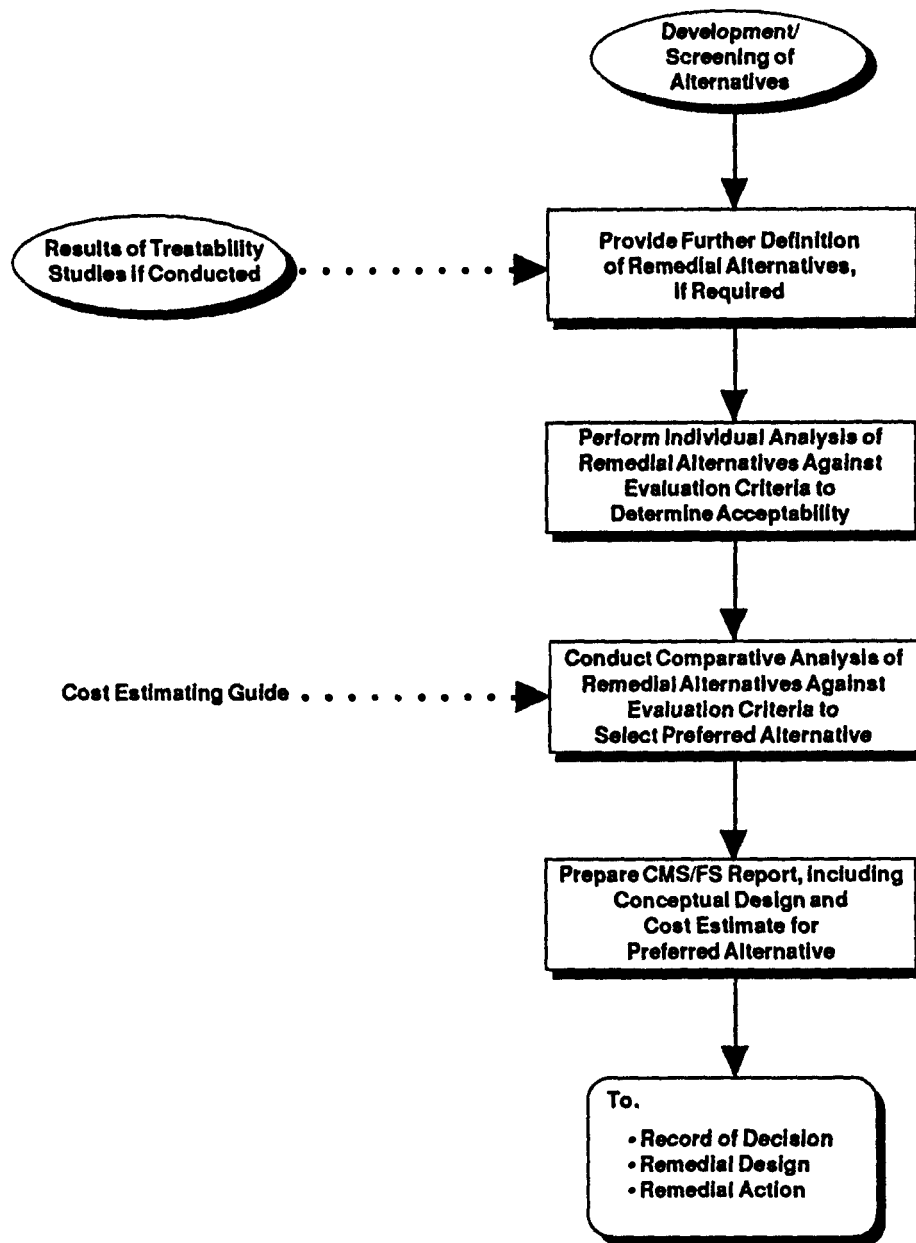
- Assemble RPOs into remedial alternatives,
- Screen remedial alternatives to eliminate infeasible and impracticable options,
- Further define alternatives as necessary,
- Analyze alternatives against nine evaluation criteria, then against each other, and
- Prepare the CMS/FS report to document results,

The above CMS/FS steps are graphically presented in Figures 2 and 3. Figure 2 shows the steps required to develop and initially screen the remedial alternatives (first five items above). Figure 3 displays the detailed analysis process (remaining three items). Four supporting documents have been developed for use in preparing all CMS/FS reports. They include a programmatic risk-based preliminary remediation goal (PRG) report (DOE, July 1994), a comprehensive list of technologies database (DOE, January 1994), a sitewide ARARs strategy document (DOE, December 1994), and a remedial cost estimating guide (DOE, estimated November 1994). Use of the four documents is referenced in the two figures. These documents will ensure consistency between OUs in the analysis of remedial actions. The sections that follow provide further information regarding the elements, available resources and references, and required deliverables associated with each CMS/FS task.

2.1 Task 1 - Establish Corrective/Remedial Action Objectives

As outlined in the IAG, the C/RAOs shall specify the contaminants and media of interest, exposure pathways and receptors, and EPA- and State-accepted levels or ranges of levels for each exposure route. The C/RAOs are to be presented in a technical memorandum submitted to the lead regulatory agency to fulfill the requirements specified in the IAG Statement of Work, Section IX A.1. The key components, resources and references, and the required deliverables for Task 1 are summarized in Table 1. A sample report outline for Technical Memorandum No. 1 (TM 1) is included in Appendix A.





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..... ➤ Resources/References

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Figure 3
Detailed Analysis
of Alternatives

TABLE 1
TASK 1 - ESTABLISH CORRECTIVE/REMEDIAL ACTION OBJECTIVES

IAG Section Requirements

Paragraphs 152 and 153
SOW IX A 1

Key Task Components

- Specify the contaminants and media of interest, exposure pathways and receptors, and EPA- and State-accepted levels or ranges of levels for each chemical (contaminant) of concern (COC) for each exposure route

CMS/FS Program Resources/References

- COC Technical Memorandum from the RFI/RI process, used as the basis for determining which contaminants need to be evaluated
- Background Geochemical Characterization Report, used to screen out COCs which are less than or equal to background concentrations
- Sitewide ARAR Strategy Document, used to provide consistency for identification of and compliance with chemical-, location-, and action-specific ARARs across RFETS
- Programmatic Risk-Based PRG Document, identifies PRGs for all COCs and screen out those COCs which are less than PRGs

Deliverables

- Technical Memorandum No 1 - Issue Preliminary Draft for internal EG&G review
- Technical Memorandum No 1 - Issue Draft for internal DOE/EG&G review
- Technical Memorandum No 1 - Issue Final for EPA/CDPHE review and comment [NOTE EPA/CDPHE approval is not required, incorporate comments as part of CMS/FS report]
- Response to EPA/CDPHE comments on Technical Memorandum No 1

2.2 Task 2 - Initial Screening of Remedial Technologies and Process Options

This task involves developing GRAs, then identifying and screening remedial technologies and process options that can effectively treat, contain, or demobilize the COCs identified in Task 1. The key task components, resources and references, and deliverables are summarized in Table 2.

For initial identification of technologies, the comprehensive list of technologies (CLT) database (DOE, January 1994) should be used. The CLT database was assembled using dBase IV® and consists of approximately 800 records, each representing a process option that may be applicable to RFETS. As an interactive database, the records can be searched and sorted via any combination of fields. However, for simplicity it is recommended that the searches and sorts be limited to the fields of "media" and "COCs." Record input/output formats were developed to facilitate these types of searches and sorts as well as to enable the user to add new information to the database. Addition of such new information is encouraged to update the CLT and to address IHSS-specific source control considerations. Complete database operating instructions are included in the CLT document.

The deliverable for Task 2 is a summary report which will represent Sections 1 through 4 of Technical Memorandum No. 2 (TM 2). An outline for TM 2 is included in Appendix A.

2.3 Task 3 - Remedial Alternative Identification

This task first involves focusing the remedial action objectives into source control areas, versus residual media contamination areas (i.e., subsurface soils not included in a source area, and ground water) so that, if necessary, an accelerated cleanup action can be applied to the source area. Remediation of residual media contamination can then proceed at a less time-critical rate as part of an OU-wide remedy. A strategy to focus the organization of source control areas versus residual media contamination should be developed in concert with DOE. Following agreement on the remedial strategy, remedial alternatives should then be identified.

TABLE 2
TASK 2 - INITIAL SCREENING OF
REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

IAG Section Requirements

Paragraphs 152 and 153
 SOW IX A 2, IX A 3, and IX A 4

Key Task Components

- Identify areas or volumes for each contaminated medium exceeding the OU-specified PRGs. Consider the chemical and physical characterization of the OU in the estimates.
- Develop GRAs to satisfy the C/RAOs for each contaminated medium. GRAs can include containment, treatment, excavation, pumping, or other actions, singly or in combination.
- For each contaminated medium, establish a list of remedial technologies and process options that are potentially applicable in achieving the C/RAOs. Assemble the technologies and process options by GRA. Use the CLT database as the initial starting point to assemble the list. The CLT is structured so that a search of the database can be performed to identify potential technologies applicable to specific medium and contaminant groups. The CLT-generated list should be expanded as required to include OU and IHSS-specific technologies and process options, including potential source control measures, IM/IRA actions, and demonstration projects.
- Screen technologies and process options to eliminate those that will not meet the medium-specific C/RAOs. The rationale for eliminating technologies and process options is to be documented. The results of the treatability study program need to be considered to determine the appropriateness of the technology and/or process option. The screening criteria are to include effectiveness, implementability, and relative cost factors. The screening process is applied in two stages. The first stage of screening is an initial technology screen based on technical implementability. The second stage includes an evaluation of effectiveness, institutional implementability, and relative cost.
- Establish representative process options for each retained technology type to develop remedial alternatives. Use of innovative technologies should be considered in the selection of a representative process option.

CMS/FS Program Resources/References

- CLT Database
- Remedial Cost Estimating Guide
- Treatability Study Results
- Previous IM/IRA Actions

Deliverables

- *Summary Report Initial Screening of Remedial Technologies* (includes Sections 1 through 4 of Technical Memorandum No. 2) - Issue as an interim deliverable for internal EG&G review.

Key components, resources and references, and required deliverables for the remedial alternatives identification are summarized in Table 3

The assembled alternatives should represent a range of treatment and containment combinations that will address either each IHSS or an OU as a whole. The remedial strategy discussed above should help to focus this organization. A summary of the assembled alternatives and their related action-specific ARARs shall be prepared for inclusion in a technical memorandum to be submitted to DOE, EPA, and/or the State for review.

The deliverable for Task 3 is a summary report which will represent Sections 5.1 and 5.2 of TM 2 (see Appendix A for TM 2 outline).

2.4 Task 4 - Remedial Alternative Screening

This task involves an initial screening of alternatives based on short- and long-term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If there are only five or fewer alternatives, screening may be omitted and the detailed analysis of alternatives (Task 6) could be implemented directly. However, if the screening of alternatives is necessary, it shall be conducted to ensure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. The key components, resources and references, and required deliverables for this task are summarized in Table 4.

As appropriate, the screening shall preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives shall include options that use treatment technologies and permanent solutions to the maximum extent practicable. The reasons for eliminating alternatives during the preliminary screening process must be specified.

TABLE 3
TASK 3 - REMEDIAL ALTERNATIVE IDENTIFICATION

IAG Section Requirements

Paragraphs 152 and 153
SOW IX A, IX A 5, and IX A 6

Key Task Components

- Assemble the GRAs (based on the selected representative process options) into remedial alternatives for each contaminated medium. The range of remedial alternatives considered shall include, at a minimum
 - Treatment technologies which reduce the toxicity, mobility, or volume of wastes (The alternatives considered vary in the types of treatment, the amount of wastes treated, and the manner in which long-term residuals or untreated wastes are managed),
 - Containment with little or no treatment,
 - A combined treatment and containment system, and
 - No action
- Assess the adequacy of existing information to allow comparison of the remedial alternatives and to provide sizing of critical unit operations, as necessary. If existing information is not adequate, recommend a treatability study to obtain the missing information
- Summarize action-specific ARARs for each alternative

CMS/FS Program Resources/References

- EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA, 1988)
- Sitewide ARAR Strategy Document

Deliverables

- *Summary Report Proposed Remedial Alternatives* - Issue Preliminary Draft as an interim deliverable for internal EG&G review
- *Summary Report Proposed Remedial Alternatives* - Issue Draft as an interim deliverable for internal DOE/EG&G review
- *Summary Report Proposed Remedial Alternatives* - Issue Final for presentation and discussion of proposed remedial alternatives with the EPA/CDPHE

TABLE 4
TASK 4 - REMEDIAL ALTERNATIVE SCREENING

IAG Section Requirements

Paragraphs 152 and 153
 SOW IX A and IX A 7

Key Task Components

- Screen remedial alternatives based on short- and long-term aspects of effectiveness, implementability, and relative cost. The goal is to retain five to seven alternatives for detailed analysis. The rationale for eliminating a remedial alternative is to be documented.
- Establish action- and location-specific ARARs for the remaining remedial alternatives.

CMS/FS Program Resources/References

- Sitewide ARAR Strategy Document
- Remedial Cost Estimating Guide
- Risk Evaluation of Remedial Alternatives (DOE, August 1994)

Deliverables

- *Summary Report Screening of Remedial Alternatives* - Issue Preliminary Draft as an interim deliverable for internal EG&G review
- *Summary Report Screening of Remedial Alternatives* - Issue Draft as an interim deliverable for internal DOE/EG&G review
- *Summary Report Screening of Remedial Alternatives* - Issue Final for presentation and discussion of remedial alternatives with the EPA/CDPHE
- Technical Memorandum No. 2 - Issue Preliminary Draft for internal EG&G review
- Technical Memorandum No. 2 - Issue Draft for internal DOE/EG&G review
- Technical Memorandum No. 2 - Issue Final for EPA/CDPHE review and comment [NOTE: EPA/CDPHE approval is not required, incorporate comments as part of CMS/FS report]
- Response to EPA/CDPHE comments on Technical Memorandum No. 2

An internal report shall be prepared which summarizes the results and reasoning employed in screening, arraying alternatives that remain after screening, and proposing the action-specific ARARs for the alternatives that remain after screening. This summary report will constitute Sections 5.3 and 6 of TM 2 (see Appendix A for TM 2 outline).

The second set of deliverables under this task shall involve preparation of TM 2 Comments received on each component summary report (TM 2 Sections 1 through 6) shall be incorporated into the preliminary draft of TM 2. Following comment resolution on the preliminary draft, the preliminary draft shall be revised and resubmitted as draft and final documents.

2.5 Task 5 - Detailed Analysis of Alternatives and CMS/FS Report Preparation

The detailed analysis shall be conducted to provide DOE (the lead agency) with the information needed to allow for the selection of a remedy. The assembled remedial alternatives shall be evaluated to ensure that the selected remedial alternative is protective of human health and the environment, is in compliance with ARARs, is cost-effective, employs permanent solutions and alternative treatment technologies consisting of resource recovery technologies to the maximum extent practicable, and addresses the preference for treatment as a principal element. Key task components, resources and references, and deliverables are summarized in Table 5.

The nine evaluation criteria to be used are

- Overall protection of human health and the environment, taking into account relevant and appropriate requirements of CERCLA and RCRA and other federal and State health and environmental laws, rules, regulations and criteria. Specific guidance on evaluating risk to workers, offsite human populations, potential future onsite human populations, and ecological receptors is provided in DOE, August 1994.
- Compliance with other ARARs [NOTE: Regulatory variances and CERCLA waivers can be used as a means to achieve compliance with an ARAR provision],

TABLE 5
TASK 5 - DETAILED ANALYSIS OF ALTERNATIVES
AND CMS/FS REPORT PREPARATION

IAG Section Requirements

Paragraphs 152 and 153
 SOW IX C and IX D

Key Task Components

- Provide a conceptual engineering design for each alternative
- Provide a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative
- Evaluate the acceptability of each alternative against the set of nine criteria Describe the results of the individual criterion assessment
- Conduct a comparative analysis of all options using the same criteria as a basis for comparison The preferred alternative shall be selected in accordance with the procedures in Part 23 of the IAG
- Prepare a conceptual cost estimate for each alternative
- Provide an implementation schedule for the preferred remedial alternative in the draft CMS/FS Report If the implementation schedule exceeds one year, interim milestones are to be provided
- Provide a long-term monitoring plan to ensure compliance with PRGs

CMS/FS Program Resources/References

- Remedial Cost Estimating Guide
- Risk Evaluation of Remedial Alternatives

Deliverables

- *Summary Report Detailed Analysis of Alternatives* - Issue Preliminary Draft as an interim deliverable for internal EG&G review
- *Summary Report Detailed Analysis of Alternatives* - Issue Draft as an interim deliverable for internal DOE/EG&G review
- *Summary Report Detailed Analysis of Alternatives* - Issue Final for presentation and discussion of proposed remedial alternatives with the EPA/CDPHE
- CMS/FS Report - Issue Draft Final for internal DOE/EG&G review
- CMS/FS Report - Issue Draft for EPA/CDPHE review and comment
- CMS/FS Report - Issue Final for EPA/CDPHE approval

- Long-term effectiveness and permanence,
- Reduction of toxicity, mobility, or volume,
- Short-term effectiveness,
- Implementability,
- Cost [NOTE Cost-effectiveness shall not be a limiting factor in remedy selection until alternatives under consideration are determined to be equally protective],
- State (or support agency) acceptance, and
- Community acceptance [NOTE Community acceptance is considered after the RFI/RI, CMS/FS reports have been released to the general public]

Contaminant fate and transport modeling may become necessary during this task to evaluate the significance of downward leaching of IHSS wastes as a potential long-term contributor to ground water contamination, and to evaluate the lateral movement and fate of contaminants once they enter ground water. Quantification of downward movement through unsaturated soils may be necessary to determine performance characteristics of source control measures that may be required to prevent contaminant migration to ground water. Quantification of contaminant movement through ground water will enable evaluation of long-term protectiveness and compliance with ARARs. It may also help to conceptualize effective ground water control alternatives. Consequently, if modeling becomes necessary, a work scope should be developed and presented to DOE. With DOE's approval, modeling activities shall then proceed.

Natural Resource Damage Assessments (NRDA) will need to be addressed during the detailed analysis of alternatives. However, the procedure to address this issue is currently being evaluated by DOE. Until specific guidance can be issued by DOE on this subject, it is recommended that the short- and long-term effectiveness of each remedial alternative be evaluated to assess the impacts to natural resources associated with residual COCs that are not remediated. Furthermore, negative environmental impact created by a remedial action, such as

loss of habitat, should also be evaluated. A qualitative cost comparison of remedial alternatives should then be performed.

The detailed analysis of alternatives shall be prepared as a summary working document. The document shall include a recommendation of preferred alternative(s), accompanied by supporting justification. A sample report outline is included in Appendix A.

Following review and acceptance of the detailed analysis of alternatives by stakeholders, a complete set of CMS/FS documents shall be prepared and submitted to stakeholders. The CMS/FS documents shall include components of TM 1, TM 2, and the detailed analysis of alternatives. A sample report outline is included in Appendix A.

REFERENCES

- DOE, January 1994 Task 3 Report, Comprehensive List of Technologies
- DOE, July 1994 Programmatic Risk-Based Preliminary Remediation Goals, prepared for USDOE Rocky Flats Plant, Golden, Colorado, Final
- DOE, August 1994 Risk Evaluation of Remedial Alternatives, EG&G RFETS, prepared for USDOE, Golden, Colorado, Draft
- DOE, November 1994 Sitewide ARARs Strategy Document (in progress)
- DOE, December 1994 Environmental Remediation Cost Estimating Guidelines (in progress)
- EPA, 1988 Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA Interim Final, USEPA, EPA/540/G-89/004

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APPENDIX A

SAMPLE OUTLINE
TECHNICAL MEMORANDUM NO 1 - DEVELOPMENT OF
CORRECTIVE/REMEDIAL ACTION OBJECTIVES

LIST OF ACRONYMS

1 0 INTRODUCTION

2 0 BACKGROUND

- 2 1 903 Pad Area
- 2 2 Mound Area
- 2 3 Northeast Trench Area
- 2 4 Southeast Trench Area
- 2 5 Surficial Soil

3 0 POTENTIAL CONTAMINANTS OF CONCERN

- 3 1 Human Health Contaminants of Concern
- 3 2 Environmental Contaminants of Concern

4 0 DEVELOPMENT OF CORRECTIVE/REMEDIAL ACTION OBJECTIVES

5 0 DEVELOPMENT OF TARGET GOALS

- 5 1 Surface Soils
 - 5 1 1 Background Concentrations
 - 5 1 2 Potential Chemical-Specific ARARs/TBCs
 - 5 1 3 Risk-Based PPRG Calculations
 - 5 1 4 Cleanup Standards at Other Colorado Sites
- 5 2 Subsurface Soils
 - 5 2 1 Background Concentrations
 - 5 2 2 Potential Chemical-Specific ARARs/TBCs
 - 5 2 3 Risk-Based PPRG Calculations
 - 5 2 4 Cleanup Standards at Other Colorado Sites
- 5 3 Ground Water
 - 5 3 1 Background Concentrations
 - 5 3 2 Potential Chemical-Specific ARARs/TBCs
 - 5 3 3 Risk-Based PPRG Calculations
 - 5 3 4 Cleanup Standards at Other Colorado Sites

References

Appendices

SAMPLE OUTLINE
TECHNICAL MEMORANDUM NO 2 - DEVELOPMENT AND
INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

LIST OF ACRONYMS

EXECUTIVE SUMMARY

1 0 INTRODUCTION

2 0 SITE CHARACTERISTICS

- 2 1 IHSS Descriptions
 - 2 1 1 903 Pad Area
 - 2 1 2 Mound Area
 - 2 1 3 East Trench Area
- 2 2 Potential Contaminants of Concern and Preliminary Remediation Goals
- 2 3 Nature and Extent of Contamination
- 2 4 Contaminant Fate and Transport

3 0 CORRECTIVE/REMEDIAL ACTION OBJECTIVE

4 0 REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

- 4 1 Identification of General Response Actions
- 4 2 Identification of Technologies and Process Options
- 4 3 Screening of Technologies and Process Options
 - 4 3 1 Initial Technology Screen
 - 4 3 2 Technology Evaluation
- 4 4 Representative Process Options

5 0 POTENTIAL REMEDIAL ALTERNATIVES

- 5 1 Assembly of Potential Remedial Alternatives
- 5 2 Description of Potential Remedial Alternatives
 - 5 2 1 Source Control For 903 Pad Lip
 - 5 2 1 1 Site Characteristics
 - 5 2 1 2 PCOCs
 - 5 2 1 3 Available On-site Treatment
 - 5 2 1 4 Assumptions
 - 5 2 1 5 Alternative 1
 - 5 2 1 6 Alternative 2
 - 5 2 1 7 Alternative 3
 - 5 2 1 8 Alternative 4
 - 5 2 1 9 Alternative 5

- 5 2 1 10 Alternative 6
- 5 2 2 Source Control for Trench 1
 - 5 2 2 1 Site Characteristics
 - 5 2 2 2 PCOCs
 - 5 2 2 3 Available On-site Treatment
 - 5 2 2 4 Assumptions
 - 5 2 2 5 Alternative 1
 - 5 2 2 6 Alternative 2
 - 5 2 2 7 Alternative 3
 - 5 2 2 8 Alternative 4
 - 5 2 2 9 Alternative 5
 - 5 2 2 10 Alternative 6
- 5 2 3 Source Control for Trench 2
 - 5 2 3 1 Site Characteristics
 - 5 2 3 2 PCOCs
 - 5 2 3 3 Available On-site Treatment
 - 5 2 3 4 Assumptions
 - 5 2 3 5 Alternative 1
 - 5 2 3 6 Alternative 2
 - 5 2 3 7 Alternative 3
 - 5 2 3 8 Alternative 4
 - 5 2 3 9 Alternative 5
 - 5 2 3 10 Alternative 6
- 5 2 4 Source Control for Trenches 2, 3, and 4
 - 5 2 4 1 Site Characteristics
 - 5 2 4 2 PCOCs
 - 5 2 4 3 Available On-site Treatment
 - 5 2 4 4 Assumptions
 - 5 2 4 5 Alternative 1
 - 5 2 4 6 Alternative 2
 - 5 2 4 7 Alternative 3
 - 5 2 4 8 Alternative 4
 - 5 2 4 9 Alternative 5
 - 5 2 4 10 Alternative 6
- 5 2 5 Media Control for Groundwater
 - 5 2 5 1 Site Characteristics
 - 5 2 5 2 PCOCs
 - 5 2 5 3 Available On-site Treatment
 - 5 2 5 4 Assumptions
 - 5 2 5 5 Alternative 1
 - 5 2 5 6 Alternative 2
 - 5 2 5 7 Alternative 3
 - 5 2 5 8 Alternative 4

- 5 2 5 9 Alternative 5
 - 5 2 5 10 Alternative 6
 - 5 3 Screening of Potential Remedial Alternatives
 - 5 3 1 Screening Criteria
 - 5 3 2 Elimination of Remedial Alternatives
- 6 0 REMEDIAL ALTERNATIVES
 - 6 1 Summary of Selected Remedial Alternatives
 - 6 2 Identification of Potential Location- and Action-Specific ARARs
 - 6 3 Post-Screening Tasks

References

Appendices

SAMPLE OUTLINE
DETAILED ANALYSIS OF ALTERNATIVES

LIST OF ACRONYMS

1 0 INTRODUCTION

2 0 INDIVIDUAL ANALYSIS OF ALTERNATIVES

2 1 Alternative 1

2 1 1 Alternative Description

2 1 2 Evaluation

2 2 Alternative 2

2 2 1 Alternative Description

2 2 2 Evaluation

2 3 Alternative 3

2 3 1 Alternative Description

2 3 2 Evaluation

3 0 COMPARATIVE ANALYSIS

4 0 ALTERNATIVE(S) SELECTED

References

Appendices

SAMPLE OUTLINE
CMS/FS REPORT

LIST OF ACONYMS
EXECUTIVE SUMMARY

1 0 INTRODUCTION

- 1 1 Purpose and Organization of Report
- 1 2 Background Information (Summarized from RI and TM Reports)
 - 1 2 1 Site Description
 - 1 2 2 Site history
 - 1 2 3 Nature and Extent of Contamination
 - 1 2 4 Contamination Fate and Transport
 - 1 2 5 Baseline Risk Assessment

2 0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

- 2 1 Introduction
- 2 2 Remedial Action Objectives (from Sections 4 and 5 of TM 1)
- 2 3 General Response Actions (from Section 4 1 of TM 2)
- 2 4 Identification and Screening of Technologies (from Sections 4 2, 4 3, and 4 4 of TM 2)

3 0 DEVELOPMENT AND SCREENING OF ALTERNATIVES

- 3 1 Development of Alternatives (from Sections 5 1 and 5 2 of TM 2)
- 3 2 Screening of Alternatives (from Sections 5 3 of TM 2) (if conducted)

4 0 DETAILED ANALYSIS OF ALTERNATIVES

- 4 1 Introduction (from Section 1 of DAA Report)
- 4 2 Individual Analysis of Alternatives (from Section 2 of DAA Report)
- 4 3 Comparative Analysis (from Section 3 of DAA Report)

5 0 SELECTED ALTERNATIVE(S)

References

Appendices

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